

CLAIMS:

1. A method of inducing an antigen-specific immune response in a mammalian subject, said method comprising the steps of:
 - 5 (a) administering to said subject an effective amount of a first composition comprising a DNA plasmid comprising a DNA sequence encoding said antigen under the control of regulatory sequences directing expression thereof by said DNA plasmid; and
 - 10 (b) administering to said subject an effective amount of a second composition comprising a recombinant vesicular stomatitis virus (VSV) comprising a nucleic acid sequence encoding said antigen under the control of regulatory sequences directing expression thereof by said recombinant VSV.
- 15 2. The method according to claim 1, wherein said VSV is replication competent.
3. The method according to claim 1, wherein said VSV is non-replicating.
- 20 4. The method according to claim 1, wherein said first composition is administered to said subject at least once prior to administration of said second composition.
- 25 5. The method according to claim 4, wherein said second composition is administered to said subject at least once.
6. The method according to claim 1, wherein said second composition is administered to said subject at least once prior to administration of said first composition.
- 30 7. The method according to claim 6, wherein said first composition is administered to said subject at least once.

8. The method according to claim 1, further comprising in step (a):
administering an effective amount of a cytokine to said mammal.

9. The method according to claim 8, wherein said cytokine is
5 administered as a nucleic acid composition comprising a DNA plasmid comprising a
DNA sequence encoding said cytokine under the control of regulatory sequences
directing expression thereof by said DNA plasmid.

10. The method according to claim 9, wherein said cytokine is selected
10 from the group consisting of IL-12, IL-15, GM-CSF, and a combination thereof.

11. The method according to claim 9, wherein said cytokine-encoding
sequence is present on the same DNA plasmid as said antigen-encoding sequence.

12. The method according to claim 9, wherein said cytokine-encoding
15 sequence is present on a DNA plasmid different from said DNA plasmid encoding
said antigen.

13. The method according to claim 1, further comprising in step (b):
20 administering an effective amount of a cytokine to said mammal.

14. The method according to claim 13, wherein said cytokine is
administered in the form of a protein.

15. The method according to claim 14, wherein said cytokine is selected
25 from the group consisting of IL-12, IL-15, GM-CSF, and a combination thereof.

16. The method according to claim 1, wherein said antigen is a protein,
polypeptide, peptide, a fragment or a fusion thereof, wherein said protein is derived
30 from a member selected from the group consisting of a bacterium, virus, fungus,
parasite, a cancer cell, a tumor cell, an allergen and a self-molecule.

17. The method according to claim 16, wherein said virus is human or simian immunodeficiency virus.

18 The method according to claim 17, wherein said antigen is selected
5 from the group consisting of *gag*, *pol*, *env*, *nef*, *vpr*, *vpu*, *vif* and *tat*, and immunogenic fragments or fusions thereof.

19. The method according to claim 1, wherein said first composition
10 comprises one DNA plasmid comprising a DNA sequence encoding more than one copy of the same or a different said antigen.

20. The method according to claim 1, wherein said first composition
15 comprises more than one DNA plasmid, wherein each DNA plasmid encodes the same or a different antigen.

21. The method according to claim 1, wherein said immune response
comprises an increase in CD8+ T cell response to said antigen greater than that
achieved by administering said DNA plasmid or recombinant VSV alone.

22. The method according to claim 1, wherein said immune response
20 comprises a synergistic increase in antibody response to said antigen greater than that
achieved by administering said first or second compositions alone.

23. The method according to claim 1, wherein said mammalian subject is
25 a primate.

24. The method according to claim 23, wherein said mammalian subject is
a human.

25. The method according to claim 1, further comprising in step (a)
30 administering at least two said DNA plasmids prior to said recombinant VSV, each
plasmid comprising a sequence encoding a different antigen.

26. The method according to claim 1, further comprising in step (b) administering at least two said recombinant VSVs.

27. The method according to claim 26, wherein each said recombinant VSV has a different VSV G protein and different VSV serotype, but the same antigen encoding sequence.

28. The method according to claim 26, wherein each said recombinant VSV has a different antigen encoding sequence, but the same VSV G protein.

29. The method according to claim 26, wherein each said recombinant VSV has a different antigen encoding sequence, and a different VSV G protein.

30. The method according to claim 26, wherein the second and any additional recombinant VSV is administered as a booster following said first recombinant VSV administration.

31. The method according to claim 30, further comprising administering at least three said boosters.

32. The method according to claim 1, wherein said DNA plasmid composition is administered in a pharmaceutically acceptable diluent, excipient or carrier.

33. The method according to claim 32, wherein said excipient comprises bupivacaine.

34. The method according to claim 1, wherein said rVSV composition is administered in a pharmaceutically acceptable diluent, excipient or carrier.

35. An immunogenic composition for inducing an antigen-specific immune response to an antigen in a mammalian subject, said immunogenic composition comprising:

5 (a) a first composition comprising a DNA plasmid comprising a DNA sequence encoding said antigen under the control of regulatory sequences directing expression thereof by said DNA plasmid; and

(b) at least one recombinant vesicular stomatitis virus (VSV) comprising a nucleic acid sequence encoding said antigen under the control of regulatory sequences directing expression thereof by said recombinant VSV.

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36. The composition according to claim 35, wherein said VSV is replication competent.

15 37. The composition according to claim 35, wherein said VSV is non-replicating.

38. The immunogenic composition according to claim 35, further comprising a cytokine composition.

20 39. The immunogenic composition according to claim 38, wherein said cytokine composition comprises a nucleic acid composition comprising a DNA plasmid comprising a DNA sequence encoding said cytokine under the control of regulatory sequences directing expression thereof by said DNA plasmid.

25 40. A kit for use in a method of inducing an antigen-specific immune response in a mammalian subject, said kit comprising
at least one first composition comprising a DNA plasmid comprising a DNA sequence encoding an antigen under the control of regulatory sequences directing expression thereof by said DNA plasmid;

at least one second composition comprising a recombinant vesicular stomatitis virus (VSV) comprising a nucleic acid sequence encoding said antigen under the control of regulatory sequences directing expression thereof by said recombinant VSV; and

5 instructions for practicing the method of claim 1.

41. The kit according to claim 40, wherein said VSV is replication competent.

10 42. The kit according to claim 40, wherein said VSV is non-replicating.

43. The kit according to claim 40, further comprising a cytokine composition.

15 44. The kit according to claim 43, wherein said cytokine composition comprises a nucleic acid composition comprising a DNA plasmid comprising a DNA sequence encoding said cytokine under the control of regulatory sequences directing expression thereof by said DNA plasmid.

20 45. Use of (a) a first composition comprising a DNA plasmid comprising a DNA sequence encoding said antigen under the control of regulatory sequences directing expression thereof by said DNA plasmid; and (b) at least one recombinant vesicular stomatitis virus (VSV) comprising a nucleic acid sequence encoding said antigen under the control of regulatory sequences directing expression thereof by said
25 recombinant VSV, in the preparation of a medicament for inducing an immune response in an animal to said antigen.